

Appendix A

**EMFAC and CALINE Modeling Reports**



**Appendix B**

**Diesel Generator Emission Estimates, SCREEN3  
Modeling, and Cancer Risk Calculations**

**Table X - Diesel Generator Emissions, Ambient Air Quality Impacts, and Diesel Particulate Cancer Risks**

**Diesel Generator Emissions Based on AP-42 Emission Factors**

Pollutant	AP-42 Factor (lbs/hp hr)	Engine hp	No. of Generators	Generator hrs/day	Generator Emissions (lbs/day)	Generator Days per Year	Generator Emissions (tons/year)
PM10	2.20E-03	12.7	4	16	1.79	365	0.326
NOx	0.031	12.7	4	16	25.20	365	4.598
CO	6.68E-03	12.7	4	16	5.43	365	0.991
SOx	2.05E-03	12.7	4	16	1.67	365	0.304

**Diesel Generator Ambient Concentrations at Receptor Locations (Based on Worst-Case SCREEN3 Modeling)**

Receptor	Location	Distance (feet)	Dispersion Factor (ug/m3)/(g/sec)	SCREEN3		8-hour Conc. (ug/m3)		Annual Conc. (ug/m3)	
				PM10	CO	PM10	CO	PM10	CO
R1	Western House	219	2041	0.00940	0.0285	19.2	58.2	13.4	40.8
R2	Eastern House	466	1355	0.00940	0.0285	12.7	38.7	8.9	27.1
R3	School balfield	370	1559	0.00940	0.0285	14.6	44.5	10.3	31.1
R4	School classroom	644	1074	0.00940	0.0285	10.1	30.6	7.1	21.4
<b>California Ambient Air Quality Standards</b>				N/A	N/A	23.200	N/A	10,440	20

1-hour concentration conversion factors: 8-hour = 0.7; annual = 0.08

**Cancer Risk from 1-Year Operation of Diesel Generators**

Receptor	Location	Distance (feet)	Annual Diesel Particulate Concentration (ug/m3)	CARB		Lifetime Exposure Factor LEA	Cancer Risk Due to Generator Exhaust
				Carcinogen Unit Risk	Factor (Risk per ug/m3)		
R1	Western House	219	1.5	3.00E-04	0.0095	4.38E-06	
R2	Eastern House	466	1.0	3.00E-04	0.0095	2.91E-06	
R3	School balfield	370	1.2	3.00E-04	0.0095	3.35E-06	
R4	School classroom	644	0.8	3.00E-04	0.0095	2.31E-06	

Note: LEA based on 16 hours per day for 1 year

**Cancer Risk from Permanent Future Use (70-Year Operation) of Diesel Generators**

Receptor	Location	Distance (feet)	Annual Diesel Particulate Concentration (ug/m3)	CARB		Lifetime Exposure Factor	Cancer Risk Due to Generator Exhaust
				Carcinogen Unit Risk	Factor (Risk per ug/m3)		
R1	Western House	219	1.5	3.00E-04	1	4.60E-04	
R2	Eastern House	466	1.0	3.00E-04	1	3.06E-04	
R3	School balfield	370	1.2	3.00E-04	1	3.52E-04	
R4	School classroom	644	0.8	3.00E-04	1	2.42E-04	

Note: LEA based on 16 hours per day, 365 days per year, for 70 years

07/13/05  
09:04:55

\*\*\* SCREEN3 MODEL RUN \*\*\*  
 \*\*\* VERSION DATED 96043 \*\*\*

San Pasqual Generators at Unit Emission Rate

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	2.0000
STK INSIDE DIAM (M)	=	.1500
STK EXIT VELOCITY (M/S)	=	20.0000
STK GAS EXIT TEMP (K)	=	373.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	1.5000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.  
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .237 M\*\*4/S\*\*3; MOM. FLUX = 1.767 M\*\*4/S\*\*2.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\*\*\*  
 \*\*\* SCREEN AUTOMATED DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
5.	3529.	4	20.0	20.0	6400.0	2.30	.51	.36	NO
100.	1664.	4	2.0	2.0	640.0	6.50	8.30	4.83	NO
200.	1063.	4	1.0	1.0	320.0	11.00	15.77	8.88	NO
300.	760.4	4	1.0	1.0	320.0	11.00	22.76	12.36	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 5. M:  
 8. 6090. 4 20.0 20.0 6400.0 2.30 .88 .58 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)  
 DWASH=NO MEANS NO BUILDING DOWNWASH USED  
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
R1 - 67.	2041.	4	3.0	3.0	960.0	5.00	5.72	3.39	NO
R2 - 142.	1355.	4	1.5	1.5	480.0	8.00	11.47	6.54	NO
R3 - 113.	1559.	4	2.0	2.0	640.0	6.50	9.27	5.33	NO
R4 - 196.	1074.	4	1.0	1.0	320.0	11.00	15.49	8.74	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)  
 DWASH=NO MEANS NO BUILDING DOWNWASH USED  
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
-----------------------	--------------------	-----------------	----------------

SIMPLE TERRAIN      6090.

8.                    SCREEN.OUT

0.

\*\*\*\*\*  
\*\* REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS \*\*  
\*\*\*\*\*

$$Q = 1 \text{ g/sec}$$

$$V_g = 20 \text{ m/s}$$

$$T_g = 100^\circ\text{C} \quad 400^\circ\text{F}$$

$$ds = 0.1 \text{ m}$$

$$\text{Ambient } x = \sim \text{ ug/m}^3$$



$$L, \text{ meters}$$

### **3.3 Gasoline And Diesel Industrial Engines**

#### **3.3.1 General**

The engine category addressed by this section covers a wide variety of industrial applications of both gasoline and diesel internal combustion (IC) engines such as aerial lifts, fork lifts, mobile refrigeration units, generators, pumps, industrial sweepers/scrubbers, material handling equipment (such as conveyors), and portable well-drilling equipment. The three primary fuels for reciprocating IC engines are gasoline, diesel fuel oil (No.2), and natural gas. Gasoline is used primarily for mobile and portable engines. Diesel fuel oil is the most versatile fuel and is used in IC engines of all sizes. The rated power of these engines covers a rather substantial range, up to 250 horsepower (hp) for gasoline engines and up to 600 hp for diesel engines. (Diesel engines greater than 600 hp are covered in Section 3.4, "Large Stationary Diesel And All Stationary Dual-fuel Engines".) Understandably, substantial differences in engine duty cycles exist. It was necessary, therefore, to make reasonable assumptions concerning usage in order to formulate some of the emission factors.

#### **3.3.2 Process Description**

All reciprocating IC engines operate by the same basic process. A combustible mixture is first compressed in a small volume between the head of a piston and its surrounding cylinder. The mixture is then ignited, and the resulting high-pressure products of combustion push the piston through the cylinder. This movement is converted from linear to rotary motion by a crankshaft. The piston returns, pushing out exhaust gases, and the cycle is repeated.

There are 2 methods used for stationary reciprocating IC engines: compression ignition (CI) and spark ignition (SI). This section deals with both types of reciprocating IC engines. All diesel-fueled engines are compression ignited, and all gasoline-fueled engines are spark ignited.

In CI engines, combustion air is first compression heated in the cylinder, and diesel fuel oil is then injected into the hot air. Ignition is spontaneous because the air temperature is above the autoignition temperature of the fuel. SI engines initiate combustion by the spark of an electrical discharge. Usually the fuel is mixed with the air in a carburetor (for gasoline) or at the intake valve (for natural gas), but occasionally the fuel is injected into the compressed air in the cylinder.

CI engines usually operate at a higher compression ratio (ratio of cylinder volume when the piston is at the bottom of its stroke to the volume when it is at the top) than SI engines because fuel is not present during compression; hence there is no danger of premature autoignition. Since engine thermal efficiency rises with increasing pressure ratio (and pressure ratio varies directly with compression ratio), CI engines are more efficient than SI engines. This increased efficiency is gained at the expense of poorer response to load changes and a heavier structure to withstand the higher pressures.<sup>1</sup>

#### **3.3.3 Emissions**

Most of the pollutants from IC engines are emitted through the exhaust. However, some total organic compounds (TOC) escape from the crankcase as a result of blowby (gases that are vented from the oil pan after they have escaped from the cylinder past the piston rings) and from the fuel tank and carburetor because of evaporation. Nearly all of the TOCs from diesel CI engines enter the

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES<sup>a</sup>

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO <sub>x</sub>	0.011	1.63	0.031	4.41	D
CO	0.439	62.7	6.68 E-03	0.95	D
SO <sub>x</sub>	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10 <sup>b</sup>	7.21 E-04	0.10	2.20 E-03	0.31	D
CO <sub>2</sub> <sup>c</sup>	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

<sup>a</sup> References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

<sup>b</sup> PM-10 = particulate matter less than or equal to 10  $\mu\text{m}$  aerodynamic diameter. All particulate is assumed to be  $\leq 1 \mu\text{m}$  in size.

<sup>c</sup> Assumes 99% conversion of carbon in fuel to CO<sub>2</sub> with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.



# South Coast Air Quality Management District

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## **Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis**

August 2003

**Table 5.** Locations of Meteorological Stations.

Station name	UTM Coordinates (m)		Lat./Long. Coordinates	
	E-W	N-S	Latitude	Longitude
Anaheim	415.0	3742.5	33°49'16"	117°55'07"
Azusa	414.9	3777.4	34°08'09"	117°55'23"
Banning	510.5	3754.5	33°55'58"	116°53'11"
Burbank	379.5	3783.0	34°10'58"	118°18'27"
Canoga Park	352.9	3786.0	34°12'23"	118°35'48"
Compton	385.5	3750.3	33°53'19"	118°14'17"
Costa Mesa	413.8	3724.2	33°39'21"	117°55'47"
Downtown Los Angeles	386.9	3770.1	34°04'02"	118°13'31"
El Toro	436.0	3720.9	33°37'39"	117°41'25"
Fontana	455.4	3773.9	34°06'24"	117°29'01"
Indio	572.3	3731.0	33°43'06"	116°13'11"
King Harbor	371.2	3744.4	33°50'00"	118°23'30"
La Canada	388.2	3786.1	34°12'42"	118°12'49"
La Habra	412.0	3754.0	33°55'28"	117°57'07"
Lancaster	396.0	3839.5	34°41'38"	118°08'08"
Lennox	373.0	3755.0	33°55'46"	118°22'26"
Long Beach	390.0	3743.0	33°49'24"	118°11'19"
Los Alamitos	404.5	3739.8	33°47'45"	118°01'54"
Lynwood	388.0	3754.0	33°55'20"	118°12'42"
Malibu	344.0	3766.9	34°01'59"	118°41'23"
Newhall	355.5	3805.5	34°22'59"	118°31'02"
Norco	446.8	3749.0	33°52'54"	117°34'31"
Palm Springs	542.5	3742.5	33°49'25"	116°32'27"
Pasadena	396.0	3778.5	34°08'38"	118°07'41"
Pico Rivera	402.3	3764.1	34°00'53"	118°03'29"
Pomona	430.8	3769.6	34°03'60"	117°44'60"
Redlands	486.2	3769.4	34°04'00"	117°09'00"
Reseda	359.0	3785.0	34°11'54"	118°31'49"
Riverside	464.8	3758.6	33°58'10"	117°22'50"
Santa Ana Canyon	431.0	3748.4	33°52'32"	117°44'46"
Upland	440.0	3773.1	34°05'55"	117°39'02"
Vernon	387.4	3762.5	33°59'55"	118°13'10"
Walnut	420.0	3761.7	33°59'41"	117°51'58"
West Los Angeles	372.3	3768.6	34°03'08"	118°23'01"
Whittier	405.3	3754.0	33°55'26"	118°01'28"

## Estimation of Health Risks

### Cancer Risks

The cancer risks from DPM occur exclusively through the inhalation pathway; therefore the cancer risks can be estimated from the following equation:

$$CR_{DPM} = C_{DPM} \cdot URF_{DPM} \cdot LEA$$

where,

$CR_{DPM}$	Cancer risk from diesel particulate matter; the probability of an individual developing cancer as a result of exposure to DPM.
$C_{DPM}$	Annual average DPM concentration in $\mu\text{g}/\text{m}^3$ .
$URF_{DPM}$	Unit risk factor for DPM; estimated probability that a person will contract cancer as a result of inhalation of a DPM concentration of 1 $\mu\text{g}/\text{m}^3$ continuously over a period of 70 years.
LEA	Lifetime exposure adjustment; values range from 0.14 to 1.0; see the discussion below.

The inhalation unit risk factor for diesel particulate was established by ARB as 300 in one million per continuous exposure of 1  $\mu\text{g}/\text{m}^3$  of DPM over a 70-year period.<sup>1</sup> The latest unit risk factors should always be used in the impact assessment (see reference #10 for a link to the latest toxicity values.)

In order to protect public health, and in accordance with the recommendations of the State of California Office of Environmental Health Hazard Assessment (OEHHA), a 70-year lifetime exposure is assumed for all receptor locations except for off-site workers (i.e., receptor locations in commercial or industrial areas). The LEA for all residential or sensitive receptors is 1.0.

It is recognized that exposures for off-site workers in commercial or industrial areas are less than 70 years. Exposure adjustments for these off-site workers are allowed as follows. When the facility and its equipment operate continuously (i.e., 24 hrs/day and 365 days/yr), the LEA for an off-site worker is 0.14 (i.e., [8 hr/day • 240 days/yr • 46 yrs]/[24 hrs/day • 365 days/yr • 70 yrs]). For all other facility operating schedules, the LEA for an off-site worker is 0.66 (i.e., 46 yr/70 yr).

A cancer risk isopleth map showing risk contours of 1, 10, and 25 in a million should be included in the impact assessment.

#### *Non-cancer Risks*

The relationship for the non-cancer health effects of DPM is given by the following equation:

$$HI_{DPM} = C_{DPM}/REL_{DPM}$$

where,

$HI_{DPM}$	Hazard Index; an expression of the potential for non-cancer health effects.
$C_{DPM}$	Annual average DPM concentration ( $\mu\text{g}/\text{m}^3$ ).
$REL_{DPM}$	Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

Title : San Diego County Avg 2005 Winter Default Title  
 Version : Emfac2002 V2.2 Apr 23 2003  
 Run Date : 07/13/05 12:25:15  
 Scen Year: 2005 -- Model Years: 1965 to 2005  
 Season : Winter  
 Area : San Diego County  
 \*\*\*\*\*  
 Year:2005 -- Model Years 1965 to 2005 Inclusive -- Winter  
 Emfac2002 Emission Factors: V2.2 Apr 23 2003

### County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name:	Carbon Monoxide	Temperature: 43F				Relative Humidity: 35%	
Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	27.968	28.401	0.000	0.000	3.641
3	9.666	13.067	11.747	38.736	78.783	53.957	12.505
5	8.959	12.020	10.891	38.736	78.783	53.957	11.718
8	8.065	10.705	9.513	30.292	61.065	47.639	10.256
10	7.560	9.970	8.762	25.985	52.105	44.296	9.460
13	6.912	9.036	7.829	20.977	41.762	40.334	8.470
15	6.540	8.506	7.311	18.380	36.438	38.282	7.920
18	6.055	7.823	6.657	15.315	30.198	35.947	7.224
20	5.773	7.431	6.289	13.705	26.942	34.826	6.831
23	5.401	6.921	5.819	11.787	23.086	33.723	6.330
25	5.184	6.627	5.552	10.773	21.060	33.348	6.044
28	4.897	6.244	5.210	9.563	18.658	33.301	5.677
30	4.728	6.023	5.016	8.926	17.403	33.613	5.469
33	4.506	5.737	4.770	8.178	15.941	34.618	5.204
35	4.377	5.575	4.632	7.796	15.203	35.669	5.056
38	4.210	5.370	4.463	7.373	14.397	37.888	4.873
40	4.115	5.258	4.373	7.178	14.038	39.853	4.776
43	3.997	5.126	4.273	7.007	13.744	43.666	4.667
45	3.935	5.063	4.228	6.968	13.702	46.891	4.619
48	3.866	5.004	4.196	7.022	13.869	52.999	4.586
50	3.838	4.991	4.200	7.133	14.137	58.107	4.591

53	3.824	5.015	4.245	7.420	14.792	67.753	4.644
55	3.836	5.063	4.307	7.700	15.416	75.842	4.714

Pollutant Name: PM10

Temperature: 43F Relative Humidity: 35%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.073	1.535	0.000	0.000	0.074
3	0.067	0.102	0.115	0.765	0.635	0.066	0.114
5	0.056	0.086	0.099	0.765	0.635	0.066	0.102
8	0.044	0.067	0.078	0.659	0.519	0.057	0.082
10	0.037	0.057	0.067	0.600	0.458	0.052	0.072
13	0.030	0.046	0.055	0.523	0.383	0.046	0.060
15	0.026	0.040	0.048	0.480	0.342	0.043	0.053
18	0.022	0.033	0.040	0.425	0.292	0.039	0.045
20	0.019	0.030	0.036	0.394	0.265	0.037	0.041
23	0.016	0.025	0.031	0.353	0.231	0.035	0.036
25	0.015	0.023	0.028	0.330	0.213	0.034	0.033
28	0.013	0.020	0.025	0.300	0.190	0.033	0.029
30	0.012	0.019	0.023	0.283	0.177	0.032	0.027
33	0.011	0.017	0.021	0.260	0.161	0.032	0.025
35	0.010	0.016	0.020	0.247	0.153	0.032	0.024
38	0.009	0.015	0.018	0.231	0.142	0.032	0.022
40	0.009	0.014	0.018	0.222	0.136	0.033	0.021
43	0.009	0.014	0.017	0.210	0.129	0.034	0.020
45	0.009	0.013	0.016	0.203	0.126	0.036	0.020
48	0.008	0.013	0.016	0.194	0.122	0.038	0.019
50	0.008	0.013	0.016	0.190	0.121	0.041	0.019
53	0.008	0.013	0.016	0.184	0.120	0.045	0.019
55	0.009	0.013	0.016	0.182	0.120	0.048	0.019

Pollutant Name: PM10 - Tire Wear

Temperature: 43F Relative Humidity: 35%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
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Pollutant	Name:	PM10	-	Break	Wear	Temperature:	43F	Relative Humidity:	35%
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20	0.013	0.013	0.013	0.013	0.013	0.013
23	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013
28	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013
33	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013
38	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013
43	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013
48	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013
53	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013

VEHSPEED.WKS

ranges: INPUT; SPEEDSUMRY; VCRATIO; FREESPEED; K

#### DATA INPUT:

## CALCULATION RESULTS:

V/C RATIO = 1.000 ADJ SPEED = 35.2 MPH  
 FREE SPEED = 65.0 MPH  
 K FACTOR = 0.649 (SEE CAPACITY ADJUSTMENT FACTORS TABLE)

		CAPACITY ADJUSTMENT (K) FACTORS			
LOS DEFINING V/C = 1.0 FOR INPUT V/C RATIO		3+ LANE RURAL FREEWAYS	2 LANE RURAL HIGHWAYS	URBAN ARTERIALS	DOWNTOWN STREETS
A/B = 1.0		110.668	110.668	110.668	110.668
B/C = 1.0		1.134	1.134	0.930	0.930
C/D = 1.0		0.930	0.819	0.740	0.740
D/E = 1.0		0.740	0.677	0.677	0.622
E/F = 1.0		0.649	0.622	0.622	0.582

$$\text{ADJ SPEED} = [\text{FREE SPEED}] / [1 + (0.15) * ((\text{K FACTOR})^{-4}) * ((\text{V/C RATIO})^4)]$$

LEVEL OF SERVICE AND V/C RATIO (LOS F>1.0)	RATIO, ADJUSTED/FREE-FLOW SPEEDS				
	FREEWAYS	HIGHWAYS	3+ LANE RURAL	2 LANE RURAL	URBAN DOWNTOWN ARTERIALS STREETS
A < 0.6	1.000	1.000	1.000	1.000	1.000
B=0.6-0.7	0.917	0.917	0.833	0.833	0.800
C=0.7-0.8	0.833	0.750	0.667	0.667	0.600
D=0.8-0.9	0.667	0.583	0.583	0.500	0.400
E=0.9-1.0	0.542	0.500	0.500	0.433	0.300

NOTES: Speed adjustment equation derived and generalized by Jones & Stokes Associates. K factors derived from travel time adjustment equation in Federal Highway Administration Traffic Assignment Workbook (1973) using V/C ratio break-points and speed ratios from the 1965 Highway Capacity Manual (Highway Research Board, 1965).

NS EW  
School Dr Valley Center Rd  
2005 No Action  
CO Emission Factors @ 4-Way Intersection  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	528	367	895	4.589	6.044	5.19
East	374	498	872	4.589	6.044	5.42
North	0	0	0	9.46	6.044	#DIV/0!
South	13	50	63	9.46	6.044	6.75

10mph (NS)-LOS F

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	WBRT
		358	WBTH
		16	WBTL
EBLT			
EBTH	494	9	4
EBRT	34	NBLT	NBTH
			NBRT

NS EW  
Lake Wohlford Rd Valley Center Rd  
2005 No Action  
CO Emission Factors @ 4-Way Intersection  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	492	378	870	4.589	6.044	5.22
East	230	332	562	4.589	6.044	5.45
North	8	8	16	7.92	6.044	6.98
South	356	368	724	7.92	6.044	6.97

15mph (NS)-LOS F

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	WBRT
6		2	WBTH
		148	WBTL
		79	
EBLT		3	
EBTH	200	224	2
EBRT	289	NBLT	NBTH
			NBRT

NS EW  
Lake Wohlford Rd School Dr  
2005 No Action  
CO Emission Factors @ 4-Way Intersection  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	10mph (EW)-LOS F		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	23	0	23	9.46	6.044	9.46
East	0	0	0	9.46	6.044	#DIV/0!
North	368	380	748	5.787	6.044	5.92
South	362	373	735	5.787	6.044	5.92

27mph (NS)-LOS A

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	WBRT
	368		WBTH
			WBTL
EBLT		18	
EBTH			362
EBRT	5	NBLT	NBTH
			NBRT

**NS**                   **EW**  
**School Dr**      **Valley Center Rd**  
2005 With Project  
**CO Emission Factors @ 4-Way Intersection**  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	586	397	983	4.589	6.044	5.18
East	410	514	924	4.589	6.044	5.40
North	0	0	0	9.46	6.044	#DIV/0!
South	57	142	199	9.46	6.044	7.02

10mph (NS)-LOS F

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	360	WBRT
			50	WBTH
				WBLT
EBLT				
EBTH	494	37		20
EBRT	92	NBLT		
				NBRT

**NS**                   **EW**  
**Lake Wohlford Rd**   **Valley Center Rd**  
2005 With Project  
**CO Emission Factors @ 4-Way Intersection**  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	508	414	922	4.589	6.044	5.24
East	240	340	580	4.589	6.044	5.44
North	8	8	16	7.92	6.044	6.98
South	382	376	758	7.92	6.044	6.99

15mph (NS)-LOS F

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	3	WBRT
6		2	158	WBTH
			79	WBLT
EBLT	3			
EBTH	208	250	2	130
EBRT	297	NBLT		
				NBRT

**NS**                   **EW**  
**Lake Wohlford Rd**   **School Dr**  
2005 With Project  
**CO Emission Factors @ 4-Way Intersection**  
Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	10mph (EW)-LOS F		Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	
West	35	0	35	9.46	6.044	9.46
East	0	0	0	9.46	6.044	#DIV/0!
North	376	406	782	5.787	6.044	5.92
South	386	391	777	5.787	6.044	5.92

27mph (NS)-LOS A

Approach Volume = Slower Traffic  
Leave Volume = Faster Traffic

SBRT	SBTH	SBLT		WBRT
	376			WBTH
				WBLT
EBLT	20			
EBTH			386	
EBRT	15	NBLT		
				NBRT

NS EW  
 School Dr Valley Center Rd  
 2005 No Action  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	528	367	895	0.041	0.055		0.05	
East	374	498	872	0.041	0.055		0.05	
North	0	0	0	0.094	0.055		#DIV/0!	
South	13	50	63	0.094	0.055		0.06	

10mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	358	WBRT
			16	WBTH
EBLT			9	WBLT
EBTH	494			
EBRT	34	NBLT	NBTH	NBRT
				4

NS EW  
 Lake Wohlford Rd Valley Center Rd  
 2005 No Action  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	492	378	870	0.041	0.055		0.05	
East	230	332	562	0.041	0.055		0.05	
North	8	8	16	0.075	0.055		0.07	
South	356	368	724	0.075	0.055		0.06	

15mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	3	WBRT
6			148	WBTH
			79	WBLT
EBLT	3			
EBTH	200		224	
EBRT	289	NBLT	NBTH	NBRT
				130

NS EW  
 Lake Wohlford Rd School Dr  
 2005 No Action  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	10mph (EW)-LOS F		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	23	0	23	0.094	0.055		0.09	
East	0	0	0	0.094	0.055		#DIV/0!	
North	368	380	748	0.051	0.055		0.05	
South	362	373	735	0.051	0.055		0.05	

27mph (NS)-LOS A

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

SBRT	SBTH	SBLT		WBRT
				WBTH
				WBLT
EBLT	18			
EBTH			362	
EBRT	5	NBLT	NBTH	NBRT

NS EW  
 School Dr Valley Center Rd  
 2005 With Project  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Final EF		
West	578	397	975	0.041	0.055	0.05	
East	410	514	924	0.041	0.055	0.05	
North	0	0	0	0.094	0.055	#DIV/0!	
South	57	134	191	0.094	0.055	0.07	

10mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

SBRT	SBTH	SBLT		WBRT	
			360	WBTH	
			50	WBLT	
EBLT	EBTH	494	37		20
EBRT		84	NBLT	NBTH	NBRT

NS EW  
 Lake Wohlford Rd Valley Center Rd  
 2005 With Project  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Final EF		
West	508	414	922	0.041	0.055	0.05	
East	240	340	580	0.041	0.055	0.05	
North	8	8	16	0.075	0.055	0.07	
South	382	376	758	0.075	0.055	0.07	

15mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

SBRT	SBTH	SBLT	3	WBRT	
6			158	WBTH	
			79	WBLT	
EBLT	EBTH	209	250		2
EBRT		297	NBLT	NBTH	NBRT

NS EW  
 Lake Wohlford Rd School Dr  
 2005 With Project  
**PM10 Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	10mph (EW)-LOS F		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Final EF		
West	35	0	35	0.094	0.055	0.09	
East	0	0	0	0.094	0.055	#DIV/0!	
North	376	406	782	0.051	0.055	0.05	
South	386	391	777	0.051	0.055	0.05	

27mph (NS)-LOS A

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

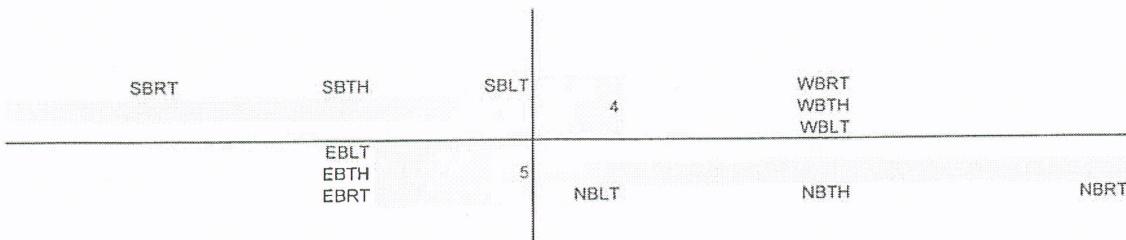
SBRT	SBTH	SBLT		WBRT	
			376	WBTH	
				WBLT	
EBLT	EBTH	20			386
EBRT		15	NBLT	NBTH	NBRT

NS EW  
 School Dr Valley Center Rd  
 2005 No Action  
**PM10 Heavy Truck Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	5	4	9	0.191	0.33	0.33	0.25	
East	4	5	9	0.191	0.33	0.33	0.27	
North	0	0	0	0.6	0.33	0.33	#DIV/0!	
South	0	0	0	0.6	0.33	0.33	#DIV/0!	

10mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

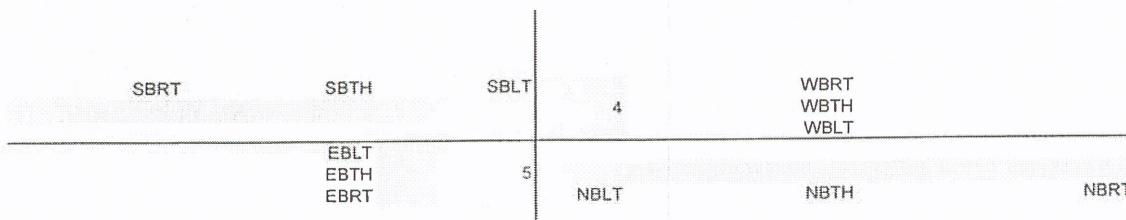


NS EW  
 Lake Wohlford Rd Valley Center Rd  
 2005 No Action  
**PM10 Heavy Truck Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	49mph (EW)-LOS A		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	5	4	9	0.191	0.33	0.33	0.25	
East	4	5	9	0.191	0.33	0.33	0.27	
North	0	0	0	0.48	0.33	0.33	#DIV/0!	
South	0	0	0	0.48	0.33	0.33	#DIV/0!	

15mph (NS)-LOS F

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic

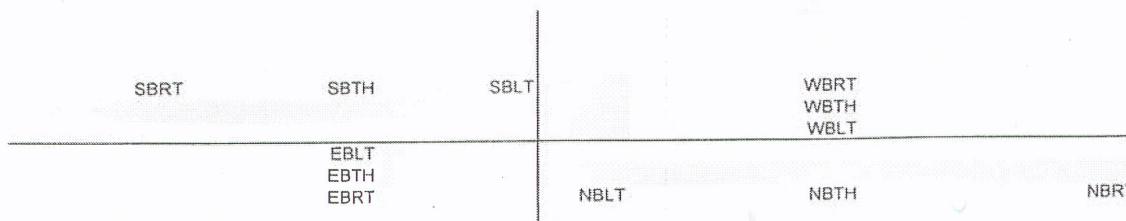


NS EW  
 Lake Wohlford Rd School Dr  
 2005 No Action  
**PM10 Heavy Truck Emission Factors @ 4-Way Intersection**  
 Insert EMFAC2002 Data to Final EF to put int Caline4

Link (From Turnlink)	Approach Volume (Bottom Turnlink Cell)	Leave Volume (Top Turnlink Cell)	Total Volume	10mph (EW)-LOS F		Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)	Final EF	Put this into Caline4
				Approach EF (EMFAC Emission factor based on VEHSPEED.xls)	Leave EF (EMFAC Emission factor based on free flow speed of ~25 mph)			
West	0	0	0	0.6	0.33	0.33	#DIV/0!	
East	0	0	0	0.6	0.33	0.33	#DIV/0!	
North	0	0	0	0.31	0.33	0.33	#DIV/0!	
South	0	0	0	0.31	0.33	0.33	#DIV/0!	

27mph (NS)-LOS A

Approach Volume = Slower Traffic  
 Leave Volume = Faster Traffic



CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 1

JOB: 2005 AM CO w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 10. DEGREES	TEMP= 10.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	EF (G/MI)	H (FT)	W (FT)		
	*	X1	Y1	X2	Y2	*	TYPE	VPH			
A. LINK A	*	-233	729	99	726	*	AG	895	5.2	.0	56.0
B. LINK B	*	452	717	102	727	*	AG	872	5.4	.0	56.0
C. LINK C	*	101	622	101	728	*	AG	63	6.8	.0	44.0
D. LINK D	*	101	617	101	323	*	AG	23	9.5	.0	44.0
E. LINK E	*	101	323	147	277	*	AG	23	9.5	.0	44.0
F. LINK F	*	147	277	735	268	*	AG	23	9.5	.0	44.0
G. LINK G	*	737	-110	737	268	*	AG	735	5.9	.0	44.0
H. LINK H	*	740	474	737	272	*	AG	748	5.9	.0	44.0
I. LINK I	*	740	481	744	716	*	AG	724	7.0	.0	44.0
J. LINK J	*	736	858	737	719	*	AG	16	7.0	.0	44.0
K. LINK K	*	455	719	739	717	*	AG	870	5.2	.0	56.0
L. LINK L	*	1203	710	744	714	*	AG	562	5.4	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 2

JOB: 2005 AM CO w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

### III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)		
	*	X	Y	Z
1. RECPT	1 *	101	751	6.0
2. RECPT	2 *	80	697	6.0
3. RECPT	3 *	120	696	6.0
4. RECPT	4 *	715	739	6.0
5. RECPT	5 *	757	743	6.0
6. RECPT	6 *	778	659	6.0
7. RECPT	7 *	702	670	6.0
8. RECPT	8 *	717	290	6.0
9. RECPT	9 *	717	246	6.0
10. RECPT	10 *	761	278	6.0
11. RECPT	11 *	96	785	6.0
12. RECPT	12 *	647	783	6.0
13. RECPT	13 *	29	320	6.0
14. RECPT	14 *	364	-37	6.0

#### IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	*	* PRED *		CONC/LINK							
	BRG	CONC	(PPM)								
	(DEG)	(PPM)	A	B	C	D	E	F	G	H	
<hr/>											
Valley Center Rd/School Dr											
1. RECPT	1	*	98.	*	.5	*	.0	.4	.0	.0	.0
2. RECPT	2	*	84.	*	.4	*	.0	.3	.0	.0	.0
3. RECPT	3	*	83.	*	.4	*	.0	.3	.0	.0	.0
Valley Center Rd/Lake Wohlford Rd											
4. RECPT	4	*	171.	*	.5	*	.0	.0	.0	.0	.0
5. RECPT	5	*	184.	*	.6	*	.0	.0	.0	.0	.0
6. RECPT	6	*	282.	*	.4	*	.0	.0	.0	.0	.0
7. RECPT	7	*	76.	*	.3	*	.0	.0	.0	.0	.0
School Dr/ Lake Wohlford Rd											
8. RECPT	8	*	8.	*	.5	*	.0	.0	.0	.0	.3
9. RECPT	9	*	8.	*	.5	*	.0	.0	.0	.0	.3
10. RECPT	10	*	351.	*	.4	*	.0	.0	.0	.0	.3
Sensitive Receptor											
11. RECPT	11	*	104.	*	.3	*	.0	.2	.0	.0	.0
12. RECPT	12	*	163.	*	.3	*	.0	.0	.0	.0	.0
13. RECPT	13	*	66.	*	.0	*	.0	.0	.0	.0	.0
14. RECPT	14	*	38.	*	.0	*	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 3

JOB: 2005 AM CO w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM)			
	*	I	J	K	L
1. RECPT	1 *	.0	.0	.0	.0
2. RECPT	2 *	.0	.0	.0	.0
3. RECPT	3 *	.0	.0	.0	.0
4. RECPT	4 *	.3	.0	.1	.0
5. RECPT	5 *	.4	.0	.0	.1
6. RECPT	6 *	.2	.0	.1	.0
7. RECPT	7 *	.2	.0	.0	.2
8. RECPT	8 *	.1	.0	.0	.0
9. RECPT	9 *	.0	.0	.0	.0
10. RECPT	10 *	.0	.0	.0	.0
11. RECPT	11 *	.0	.0	.0	.0
12. RECPT	12 *	.0	.0	.1	.0
13. RECPT	13 *	.0	.0	.0	.0
14. RECPT	14 *	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 1

JOB: 2005 AM w Project - CO  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 10. DEGREES	TEMP= 10.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	EF (G/MI)	H (FT)	W (FT)		
	*	X1	Y1	X2	Y2	*	TYPE	VPH			
A. LINK A	*	-233	729	99	726	*	AG	975	5.2	.0	56.0
B. LINK B	*	452	717	102	727	*	AG	924	5.4	.0	56.0
C. LINK C	*	101	622	101	728	*	AG	191	7.1	.0	44.0
D. LINK D	*	101	617	101	323	*	AG	35	9.5	.0	44.0
E. LINK E	*	101	323	147	277	*	AG	35	9.5	.0	44.0
F. LINK F	*	147	277	735	268	*	AG	35	9.5	.0	44.0
G. LINK G	*	737	-110	737	268	*	AG	777	5.9	.0	44.0
H. LINK H	*	740	474	737	272	*	AG	782	5.9	.0	44.0
I. LINK I	*	740	481	744	716	*	AG	758	7.0	.0	44.0
J. LINK J	*	736	858	737	719	*	AG	16	7.0	.0	44.0
K. LINK K	*	455	719	739	717	*	AG	922	5.2	.0	56.0
L. LINK L	*	1203	710	744	714	*	AG	580	5.4	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 2

JOB: 2005 AM w Project - CO  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

### III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)		
	*	X	Y	Z
1. RECPT	1 *	101	751	6.0
2. RECPT	2 *	80	697	6.0
3. RECPT	3 *	120	696	6.0
4. RECPT	4 *	715	739	6.0
5. RECPT	5 *	757	743	6.0
6. RECPT	6 *	778	659	6.0
7. RECPT	7 *	702	670	6.0
8. RECPT	8 *	717	290	6.0
9. RECPT	9 *	717	246	6.0
10. RECPT	10 *	761	278	6.0
11. RECPT	11 *	96	785	6.0
12. RECPT	12 *	647	783	6.0
13. RECPT	13 *	29	320	6.0
14. RECPT	14 *	364	-37	6.0

### IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	*	* PRED *	CONC/LINK							
	* BRG	* CONC *	(PPM)							
	* (DEG)	* (PPM)	A	B	C	D	E	F	G	H
Valley Center Rd/School Dr										
1. RECPT	1 *	98. *	.5 *	.0	.4	.0	.0	.0	.0	.0
2. RECPT	2 *	84. *	.5 *	.0	.3	.0	.0	.0	.0	.0
3. RECPT	3 *	83. *	.4 *	.0	.3	.0	.0	.0	.0	.0
Valley Center Rd/Lake Wohlford Rd										
4. RECPT	4 *	171. *	.5 *	.0	.0	.0	.0	.0	.0	.0
5. RECPT	5 *	184. *	.6 *	.0	.0	.0	.0	.0	.0	.0
6. RECPT	6 *	282. *	.4 *	.0	.0	.0	.0	.0	.0	.0
7. RECPT	7 *	76. *	.3 *	.0	.0	.0	.0	.0	.0	.0
School Dr/Lake Wohlford Rd										
8. RECPT	8 *	8. *	.5 *	.0	.0	.0	.0	.0	.0	.4
9. RECPT	9 *	8. *	.5 *	.0	.0	.0	.0	.0	.0	.3
10. RECPT	10 *	351. *	.5 *	.0	.0	.0	.0	.0	.0	.3
Sensitive Receptor										
11. RECPT	11 *	104. *	.3 *	.0	.2	.0	.0	.0	.0	.0
12. RECPT	12 *	163. *	.3 *	.0	.0	.0	.0	.0	.0	.0
13. RECPT	13 *	66. *	.0 *	.0	.0	.0	.0	.0	.0	.0
14. RECPT	14 *	38. *	.0 *	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 3

JOB: 2005 AM w Project - CO  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM)			
	*	I	J	K	L
1. RECPT	1 *	.0	.0	.0	.0
2. RECPT	2 *	.0	.0	.0	.0
3. RECPT	3 *	.0	.0	.0	.0
4. RECPT	4 *	.3	.0	.2	.0
5. RECPT	5 *	.4	.0	.0	.1
6. RECPT	6 *	.2	.0	.1	.0
7. RECPT	7 *	.2	.0	.0	.2
8. RECPT	8 *	.1	.0	.0	.0
9. RECPT	9 *	.0	.0	.0	.0
10. RECPT	10 *	.0	.0	.0	.0
11. RECPT	11 *	.0	.0	.0	.0
12. RECPT	12 *	.0	.0	.1	.0
13. RECPT	13 *	.0	.0	.0	.0
14. RECPT	14 *	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 1

JOB: 2005 AM w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	0. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	EF (G/MI)	H (FT)	W (FT)		
	*	X1	Y1	X2	Y2	*	TYPE	VPH			
A. LINK A	*	-233	729	99	726	*	AG	895	.0	.0	56.0
B. LINK B	*	452	717	102	727	*	AG	872	.0	.0	56.0
C. LINK C	*	101	622	101	728	*	AG	63	.0	.0	44.0
D. LINK D	*	101	617	101	323	*	AG	23	.0	.0	44.0
E. LINK E	*	101	323	147	277	*	AG	23	.0	.0	44.0
F. LINK F	*	147	277	735	268	*	AG	23	.0	.0	44.0
G. LINK G	*	737	-110	737	268	*	AG	735	.0	.0	44.0
H. LINK H	*	740	474	737	272	*	AG	748	.0	.0	44.0
I. LINK I	*	740	481	744	716	*	AG	724	.0	.0	44.0
J. LINK J	*	736	858	737	719	*	AG	16	.0	.0	44.0
K. LINK K	*	455	719	739	717	*	AG	870	.0	.0	56.0
L. LINK L	*	1203	710	744	714	*	AG	562	.0	.0	56.0

□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 2

JOB: 2005 AM w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)		
	X	Y	Z	
1. RECPT	1 *	101	751	6.0
2. RECPT	2 *	80	697	6.0
3. RECPT	3 *	120	696	6.0
4. RECPT	4 *	715	739	6.0
5. RECPT	5 *	757	743	6.0
6. RECPT	6 *	778	659	6.0
7. RECPT	7 *	702	670	6.0
8. RECPT	8 *	717	290	6.0
9. RECPT	9 *	717	246	6.0
10. RECPT	10 *	761	278	6.0
11. RECPT	11 *	96	785	6.0
12. RECPT	12 *	647	783	6.0
13. RECPT	13 *	29	320	6.0
14. RECPT	14 *	364	-37	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	*	* PRED *	CONC/LINK									
	* BRG	* CONC *	(PPM)									
	* (DEG)	* (PPM)	A	B	C	D	E	F	G	H		
Valley Center Rd/School Dr	*	*	*	*	*	*	*	*	*	*		
1. RECPT	1 *	98.	*	5.6	*	.0	4.4	.0	.0	.0	.0	.0
2. RECPT	2 *	84.	*	4.8	*	.3	3.4	.2	.0	.0	.0	.0
3. RECPT	3 *	83.	*	4.6	*	.0	3.6	.0	.0	.0	.0	.0
Valley Center Rd/Lake Wohlford Rd	*	*	*	*	*	*	*	*	*	*	*	*
4. RECPT	4 *	171.	*	5.5	*	.0	.0	.0	.0	.0	.3	.5
5. RECPT	5 *	184.	*	6.1	*	.0	.0	.0	.0	.0	.5	.6
6. RECPT	6 *	282.	*	4.2	*	.2	.8	.0	.0	.0	.0	.0
7. RECPT	7 *	76.	*	3.4	*	.0	.0	.0	.0	.0	.0	.0
School Dr/ Lake Wohlford Rd	*	*	*	*	*	*	*	*	*	*	*	*
8. RECPT	8 *	8.	*	4.9	*	.0	.0	.0	.0	.0	.0	3.4
9. RECPT	9 *	8.	*	5.0	*	.0	.0	.0	.0	.0	.7	2.9
10. RECPT	10 *	351.	*	4.5	*	.0	.0	.0	.0	.0	.0	3.1
Sensitive Receptor	*	*	*	*	*	*	*	*	*	*	*	*
11. RECPT	11 *	104.	*	2.8	*	.0	1.8	.0	.0	.0	.0	.0
12. RECPT	12 *	157.	*	2.8	*	.0	.0	.0	.0	.0	.0	.2
13. RECPT	13 *	64.	*	.9	*	.0	.0	.0	.0	.0	.0	.0
14. RECPT	14 *	38.	*	1.0	*	.0	.0	.0	.0	.0	.0	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 3

JOB: 2005 AM w/o Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK			
	*	(PPM)			
	*	I	J	K	L
1. RECPT	1 *	.3	.0	.6	.3
2. RECPT	2 *	.0	.0	.6	.3
3. RECPT	3 *	.0	.0	.6	.2
4. RECPT	4 *	2.9	.0	1.7	.0
5. RECPT	5 *	3.7	.0	.0	1.2
6. RECPT	6 *	1.7	.0	1.6	.0
7. RECPT	7 *	1.6	.0	.0	1.8
8. RECPT	8 *	1.1	.0	.1	.3
9. RECPT	9 *	.9	.0	.0	.3
10. RECPT	10 *	.9	.0	.4	.0
11. RECPT	11 *	.4	.0	.5	.1
12. RECPT	12 *	1.2	.0	1.4	.0
13. RECPT	13 *	.3	.0	.2	.3
14. RECPT	14 *	.3	.0	.0	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 1

JOB: 2005 AM w Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	0. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	EF (G/MI)	H (FT)	W (FT)		
	*	X1	Y1	X2	Y2	*	TYPE	VPH			
A. LINK A	*	-233	729	99	726	*	AG	975	.0	.0	56.0
B. LINK B	*	452	717	102	727	*	AG	924	.0	.0	56.0
C. LINK C	*	101	622	101	728	*	AG	191	.0	.0	44.0
D. LINK D	*	101	617	101	323	*	AG	35	.0	.0	44.0
E. LINK E	*	101	323	147	277	*	AG	35	.0	.0	44.0
F. LINK F	*	147	277	735	268	*	AG	35	.0	.0	44.0
G. LINK G	*	737	-110	737	268	*	AG	777	.0	.0	44.0
H. LINK H	*	740	474	737	272	*	AG	782	.0	.0	44.0
I. LINK I	*	740	481	744	716	*	AG	758	.0	.0	44.0
J. LINK J	*	736	858	737	719	*	AG	16	.0	.0	44.0
K. LINK K	*	455	719	739	717	*	AG	922	.0	.0	56.0
L. LINK L	*	1203	710	744	714	*	AG	580	.0	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 2

JOB: 2005 AM w Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

### III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)		
	*	X	Y	Z
1. RECEPT	1 *	101	751	6.0
2. RECEPT	2 *	80	697	6.0
3. RECEPT	3 *	120	696	6.0
4. RECEPT	4 *	715	739	6.0
5. RECEPT	5 *	757	743	6.0
6. RECEPT	6 *	778	659	6.0
7. RECEPT	7 *	702	670	6.0
8. RECEPT	8 *	717	290	6.0
9. RECEPT	9 *	717	246	6.0
10. RECEPT	10 *	761	278	6.0
11. RECEPT	11 *	96	785	6.0
12. RECEPT	12 *	647	783	6.0
13. RECEPT	13 *	29	320	6.0
14. RECEPT	14 *	364	-37	6.0

#### IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	*	*	PRED	*	CONC/LINK							
	* BRG	* CONC	*	(PPM)								
	* (DEG)	* (PPM)	*	A	B	C	D	E	F	G	H	
<hr/>												
Valley Center Rd/School Dr												
1. RECPT	1	*	98.	*	6.0	*	.0	4.6	.0	.0	.0	.0
2. RECPT	2	*	84.	*	5.5	*	.3	3.5	.6	.0	.0	.0
3. RECPT	3	*	282.	*	4.7	*	3.9	.2	.6	.0	.0	.0
Valley Center Rd/Lake Wohlford Rd												
4. RECPT	4	*	170.	*	6.2	*	.0	.0	.0	.0	.0	.2
5. RECPT	5	*	184.	*	7.0	*	.0	.0	.0	.0	.0	.5
6. RECPT	6	*	282.	*	4.8	*	.2	.8	.0	.0	.0	.0
7. RECPT	7	*	76.	*	3.8	*	.0	.0	.0	.0	.0	.0
School Dr/Lake Wohlford Rd												
8. RECPT	8	*	8.	*	5.3	*	.0	.0	.0	.0	.0	.0
9. RECPT	9	*	8.	*	5.4	*	.0	.0	.0	.0	.1	.8
10. RECPT	10	*	351.	*	4.8	*	.0	.0	.0	.0	.0	.0
Sensitive Receptor												
11. RECPT	11	*	104.	*	3.0	*	.0	1.8	.0	.0	.0	.0
12. RECPT	12	*	149.	*	3.1	*	.0	.0	.0	.0	.0	.0
13. RECPT	13	*	66.	*	1.0	*	.0	.0	.0	.1	.0	.0
14. RECPT	14	*	34.	*	1.1	*	.0	.0	.0	.0	.0	.2

□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 3

JOB: 2005 AM w Project  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK			
	*	I	J	K	L
1. RECPT	1 *	.4	.0	.7	.3
2. RECPT	2 *	.1	.0	.6	.3
3. RECPT	3 *	.0	.0	.0	.0
4. RECPT	4 *	3.7	.0	1.8	.0
5. RECPT	5 *	4.6	.0	.0	1.2
6. RECPT	6 *	2.1	.0	1.7	.0
7. RECPT	7 *	1.9	.0	.0	1.9
8. RECPT	8 *	1.3	.0	.1	.3
9. RECPT	9 *	1.0	.0	.0	.3
10. RECPT	10 *	1.1	.0	.4	.0
11. RECPT	11 *	.5	.0	.5	.1
12. RECPT	12 *	1.6	.0	1.5	.0
13. RECPT	13 *	.4	.0	.1	.4
14. RECPT	14 *	.5	.0	.0	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL  
JUNE 1989 VERSION  
PAGE 1

JOB: 2005 AM PM10 w/o Project - Heavy truck  
RUN: CALINE4 RUN (WORST CASE ANGLE)  
POLLUTANT: Particulate  
(NOTE: OUTPUT IN MICRO-GRAMS/METER\*\*3. IGNORE PPM LABEL)

#### I. SITE VARIABLES

U= 1.0 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 10. DEGREES	TEMP= 10.0 DEGREE (C)	

#### II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	EF (G/MI)	H (FT)	W (FT)		
	*	X1	Y1	X2	Y2	*	TYPE	VPH			
A. LINK A	*	-233	729	99	726	*	AG	9	.3	.0	56.0
B. LINK B	*	452	717	102	727	*	AG	9	.3	.0	56.0
C. LINK C	*	455	719	739	717	*	AG	9	.3	.0	56.0
D. LINK D	*	1203	710	744	714	*	AG	9	.3	.0	56.0

#### III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)		
	*	X	Y	Z
1. RECPT	1 *	96	785	6.0
2. RECPT	2 *	647	783	6.0
3. RECPT	3 *	29	320	6.0
4. RECPT	4 *	364	-37	6.0

#### IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	*	*	PRED	*	CONC/LINK (PPM)				
	*	BRG	*	CONC	*	A	B	C	D
	*	(DEG)	*	(PPM)	*				
1. RECPT	1 *	100.	*	.3 *	.0	.1	.0	.0	
2. RECPT	2 *	260.	*	.2 *	.0	.1	.0	.0	
3. RECPT	3 *	63.	*	.0 *	.0	.0	.0	.0	
4. RECPT	4 *	38.	*	.0 *	.0	.0	.0	.0	

**San Pasqual Parking Lot**  
**CO Hot Spot Concentrations (ppm)**

<b>2005 AM Without Project</b>	
Receptor	Caline output (Highest Emission Level)
Valley Center Rd and School Dr	0.5
Valley Center Rd and Lake Wohlford	0.6
School Dr and Lake Wohlford	0.5

<b>2005 AM With Project</b>	
Receptor	Caline output (Highest Emission Level)
Valley Center Rd and School Dr	0.5
Valley Center Rd and Lake Wohlford	0.6
School Dr and Lake Wohlford	0.5

<b>Background CO Levels</b> (2nd highest monitoring data of last 3 yrs)	
Receptor	Persistence Factor
Valley Center Rd and School Dr	0.7
Valley Center Rd and Lake Wohlford	0.7
School Dr and Lake Wohlford	0.7

<b>RESULTS</b>	
Receptor	Persistence Factor
Valley Center Rd and School Dr	0.7
Valley Center Rd and Lake Wohlford	0.7
School Dr and Lake Wohlford	0.7

<b>Background CO Levels</b> (2nd highest monitoring data of last 3 yrs)	
Receptor	Persistence Factor
Valley Center Rd and School Dr	0.7
Valley Center Rd and Lake Wohlford	0.7
School Dr and Lake Wohlford	0.7

<b>RESULTS</b>	
Receptor	Persistence Factor
Valley Center Rd and School Dr	0.7
Valley Center Rd and Lake Wohlford	0.7
School Dr and Lake Wohlford	0.7

<b>Background CO Levels</b> (2nd highest monitoring data of last 3 yrs)	
Receptor	Persistence Factor
Valley Center Rd and School Dr	0.7
Valley Center Rd and Lake Wohlford	0.7
School Dr and Lake Wohlford	0.7

**San Pasqual Parking Lot**  
**PM10 Concentrations (ug/m<sup>3</sup>)**

**2005 AM Without Project**

Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration
Valley Center Rd and School Dr	5.6	0.4	5.6
Valley Center Rd and Lake Wohlford	6.1	0.4	6.1
School Dr and Lake Wohlford	5.0	0.4	5.0
R 1	2.8	0.4	2.8
R 2	2.8	0.4	2.8
R 3	0.9	0.4	0.9
R 4	1.0	0.4	1.0

Background PM10 Levels  
(2nd highest monitoring data of last 3 yrs)

Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration
Valley Center Rd and School Dr	5.6	0.4	5.6
Valley Center Rd and Lake Wohlford	6.1	0.4	6.1
School Dr and Lake Wohlford	5.0	0.4	5.0
R 1	2.8	0.4	2.8
R 2	2.8	0.4	2.8
R 3	0.9	0.4	0.9
R 4	1.0	0.4	1.0

Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration
Valley Center Rd and School Dr	6.0	0.4	6.0
Valley Center Rd and Lake Wohlford	7.0	0.4	7.0
School Dr and Lake Wohlford	5.4	0.4	5.4
R 1	3.0	0.4	3.0
R 2	3.1	0.4	3.1
R 3	1.0	0.4	1.0
R 4	1.1	0.4	1.1

Background CO Levels  
(2nd highest monitoring data of last 3 yrs)

Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration
Valley Center Rd and School Dr	47.2	0.4	47.2
Valley Center Rd and Lake Wohlford	47.4	0.4	47.4
School Dr and Lake Wohlford	47.0	0.4	47.0
R 1	46.1	0.4	46.1
R 2	46.1	0.4	46.1
R 3	45.4	0.4	45.4
R 4	45.4	0.4	45.4

Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration
Valley Center Rd and School Dr	47.4	0.4	47.4
Valley Center Rd and Lake Wohlford	47.8	0.4	47.8
School Dr and Lake Wohlford	47.2	0.4	47.2
R 1	46.2	0.4	46.2
R 2	46.2	0.4	46.2
R 3	45.4	0.4	45.4
R 4	45.4	0.4	45.4

**San Pasqual Parking Lot**  
**PM10 Heavy Truck Tailpipe Concentrations (ug/m<sup>3</sup>)**

2005 AM (Same for Both without and With Project)		Background PM10 Levels (2nd highest monitoring data of last 3 yrs)				
Receptor	Caline Input (Highest Emission Level)	Persistence Factor	Future 1-Hr Concentration	Future 24-Hr Concentration	1-Hr Ave.	24-Hr Ave.
R 1	0.3	0.4	0.3	45.1	45.0	
R 2	0.2	0.4	0.2	45.1		
R 3	0.0	0.4	0.0	45.0		
R 4	0.0	0.4	0.0	45.0		

RESULTS	Future 24-Hr	Future 24-Hr
	Concentration	Concentration